Plant Biology A: Gene Expression and Genetic Diversity (56.0)

National Program Leader: Liang- Shiou Lin
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Program Goals

- To obtain a detailed understanding of the regulation of gene expression in agricultural plants to better use agriculturally important genes for improved crop production and quality
- To enhance the genetic diversity of existing crops with the possibility of developing novel crops to meet future challenges

Plant Biology A: Gene Expression and Genetic Diversity (56.0)

Program Priorities for FY 2007

Research priorities:

1. Functional studies of agricultural important genes and gene products
2. Regulatory mechanisms of gene expression (systems level studies encouraged)

Integrated priority:

Increase genetic diversity and educate scientists in principles and techniques of germplasm enhancement

NOTE for FY 2007:

- Letters of Intent required (Due Oct 5, 2006)
- Proposal due date – December 14, 2006

Plant Biology A: Gene Expression and Genetic Diversity (56.0)

Program Statistics – FY 2006

- # of Proposals Submitted: 63
- # of Proposals Awarded: 17 (including conferences, AREA awards)
- % Success: 26.9% overall; 24% standard grants
- Average Award Size: $347,636 (not counting conferences, postdoc, equipment)
- Average Award Duration: 2.75 years

Plant Biology B: Environmental Stress (56.0)

National Program Leader: Gail McLean
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Program Goals

- Increase fundamental knowledge of genes, proteins, and networks involved in plant abiotic stress response and adaptation
- Develop approaches and tools to aid agricultural plant productivity in response to reduced inputs or increased environmental stresses
- Develop, through biotechnology or breeding, new plant lines or populations with improved abiotic stress tolerance in agricultural plants

Plant Biology B: Environmental Stress (56.0)

FY 2007 Program Priorities

Research:

- Identify and characterize genes, proteins, and pathways contributing to abiotic stress tolerance in the areas of:
  - Water stress
  - Global change
  - Nutrient stress (solicited on odd-numbered fiscal years)
  - Temperature stress (solicited on even-numbered fiscal years)

Integrated:

- Train scientists in plant breeding, with particular emphasis on developing drought-tolerant plants

***NOTE for FY 2007*:**

- Letters of Intent required (due Oct 5, 2006)
- Proposal due date – Dec 14, 2006

Plant Biology B: Environmental Stress (56.0)

Program Statistics – FY 2006

- # of Proposals Submitted: 94
- # of Awards: 14 (including conferences, AREA awards)
- % Success: 15% overall; 11% standard grants
- Average Award Size: $356,143 (not including conferences, postdoc, equipment, integrated)
- Average Award Duration: 2.7 years

Plant Biology C: Biochemistry (56.0)

National Program Leader: Gail McLean
Gmclean@csrees.usda.gov

Program Goals

- Increase fundamental knowledge of biochemical pathways, processes, and mechanisms which can lead to improved utilization of genomics in agricultural plants
- Create improved agricultural plant lines or populations through use of basic biochemical knowledge and biotechnology
- Develop model agricultural species for biochemical studies

Plant Biology C: Biochemistry (56.0)

FY 2007 Program Priorities

Research:

- Identify and characterize genes, proteins, and regulatory mechanisms involved in plant biochemical pathways for:
    - Primary and secondary metabolism
    - Cell wall synthesis and degradation
    - Photosynthesis and respiration (solicited on even numbered fiscal years)
    - Nitrogen fixation (solicited on odd numbered fiscal years)

NOTE for FY 2007:

- Letters of Intent – due Dec 6, 2006
- Proposal due date – Feb 14, 2007

Plant Biology C: Biochemistry (56.0)

Program Statistics – FY 2006

- # of Proposals Submitted: 97
- # of Awards: 21 (including conferences, AREA awards)
- % Success: 22% overall; 14% standard grants
- Average Award Size: $336,300 (not including conferences, postdoc, equipment)
- Average Award Duration: 2.9 years

Plant Biology D: Growth and Development (56.0)

National Program Leader: Liang- Shiou Lin
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Program Goals

- To develop crop models for studying plant developmental processes
- Detailed understanding of signal transduction mechanisms to improve performance of agricultural plants
- To enhance the ability to alter developmental processes of agricultural plants to improve plant characteristics

Plant Biology D: Growth and Development (56.0)

Research Priorities for FY 2007

- Developmental pathways leading to the formation of vegetative or reproductive structures
- Hormonal regulation of growth and development; cross-talks between signaling pathways using metabolomic tools encouraged
- Characterization of cellular structures and processes crucial for plant development

NOTE for FY 2007:

- Letters of Intent required – Due Dec 6, 2006
- Proposal due date – Feb 14, 2006

Plant Biology D: Growth and Development (56.0)

Program Statistics – FY 2006

- # of Proposals Submitted: 107
- # of Proposals Awarded: 18 (including conferences, AREA awards)
- % Success: 16.8% overall; 11% standard grants
- Average Award Size: $345,800 (not counting conferences, postdoc, equipment)
- Average Award Duration: 2.9 years

NRI Plant Genome

Goals / Priorities

- Research
  - Genome-wide approaches for mapping and identification of important genes, MAS, QTL analysis, bioinformatics, comparative and functional genomics for agriculturally significant plant families. In FY2007 the focus is *solanaceae*. Next year in FY 2008 the focus will be *rosaceae* and *compositae*.

- Integrated
  - Application of genome discoveries and technology for U.S. crop or forestry improvement.

Changes For FY 2007

- Research Program elements *52.1A – Tools, Resources and Bioinformatics* and; *52.1B – Functional Genomics*, will focus on economically significant fruit, vegetable, and ornamental plants in solanaceae.

- Research Program element *52.1C – Genome Structure and Organization* will NOT be offered.

- Integrated Program element *52.1D – Applied Plant Genomics Coordinated Agricultural Project (CAP)* will be offered, is open to ALL applicants and is NOT plant species specific. Letter of intent is REQUIRED December 6, 2006. Only PD's that receive notification encouraging a submission can submit a CAP application.

- Applications due February 14, 2007.

Funding Statistics
FY 2006

	Genome Tools, Resources & Bioinformatics	Functional Genomics	Genome Structure & Organization	Integrated Applied Genomics CAP
No. of proposals submitted	27	26	2	7
No. of proposals awarded	5	5	1	1
% Success	19	19	50	14
Average Award Size ($)	412K	387K	1M	5M
Average Duration (Years)	2.6	2.6	3	4

Plant Genome

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Plant Feedstock Genomics for Bioenergy: USDA, DOE Joint Program

Goals / Priorities

- Improved use of biomass and plant feedstocks for production of fuels (e.g. ethanol or renewable feedstocks).
- Improved biomass characteristics, biomass yield or facilitation of lignocellulosic degradation.
- Identification of genetic indicators enabling plants to be efficiently bred or manipulated leading to improved feedstock characterization and sustainability.

FY 2007

- RFA released October 10, 2006
- http://genomicsgtl.energy.gov/research /DOEUSDA/
- Preapplication due November 13, 2006
- PD will receive notification encouraging or discouraging a formal application by December 7, 2006
- Only encouraged preapplicants may submit a full application
- Full applications due January 30, 2007

Funding Statistics FY 2006

- 105 preapplications submitted, 30 encouraged to submit full applications
- 28 full applications reviewed, 9 awarded
- 32% success rate
- Award Abstracts available at: http://genomicsgtl.energy.gov/research /DOEUSDA/
- Average award size: $637,444
- Duration: 2.7 years
- Annual awardee meeting at GTL 2007 and PAG 2008

Plant Feedstock Genomics for Bioenergy: USDA, DOE Joint Program

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Plant Biosecurity Program

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Goals / Priorities (Integrated Program)

- **Protection & safety of the Nation's agriculture & food supply**
- **The 5 phases of biohazards: detection, diagnosis, mitigation, management & recovery**
- **Focus on critical emerging issues: e.g. early detection of high consequence diseases; tools that integrate disease outbreak data with geographic information for analysis of spread**

Integrated project proposals must include research, education, and extension/outreach objectives (at least 2 of 3).

Significant Changes for FY 2007

1) Mitigation of diseases caused by *Phytopthora, Ralstonia, Xyella,* or *Liberobacter asiaticum* through extension / education programs to implement strategies resulting from, or developed in conjunction with, etiological and epidemiological investigations. These investigations should integrate disease outbreak and vector dispersal data with appropriate scale geographic information; and

2) Utilization and implementation of emerging technologies for field-based detection/diagnostic tools, and real time monitoring/diagnosis to facilitate mitigation of the establishment and spread of high consequence diseases.

<u>Program will likely continue at $4 million for the FY</u>

Funding Statistics: Plant Biosecurity

	FY 2003	FY 2004	FY2005
No. of Awards	8	6	6
% success	20	22	20
Funding Distribution (in $1,000) (n = # of awards)			
$0 to $250	3		
>$250 to $500	2	3	1
>$500 to $750			3
>$750 to 1,000	3	3	2
Avg (all years) = $579 Range: $50 to $1,000			

(FY 2006 proposals currently being processed)